

# Maryland Licensed Tree Expert Exam Study Guide

## For Exam Domain:

### Safety

#### Version 5.1

The ANSI Z133 Standards contain arboriculture safety requirements for pruning, repairing, maintaining, and removing trees; cutting brush; and for using equipment in such operations. All Maryland Licensed Tree Experts shall comply with these safety standards while working in the State of Maryland. **Each person**, employee or other, shall be responsible for his/her own safety and comply with the appropriate Federal and state occupational safety and health standards and all rules, regulations, and orders which are applicable to his/her own actions and conduct.

Employers shall instruct their employees in the proper use, inspection and maintenance of tools and equipment, including ropes and lines; and require that appropriate working practices be followed. A job briefing shall be performed by the qualified tree expert in charge before the start of each job. The briefing shall be communicated to all affected workers. Instruction shall be provided in the identification, preventive measures, and first-aid treatment of common poisonous plants (poison ivy, poison oak and poison sumac), stinging/biting insects and other pests indigenous to the area in which work is to be performed.

A first-aid kit, adequately stocked and maintained, shall be provided by the employer. Tree Experts and other workers shall be instructed in its use and specific location.

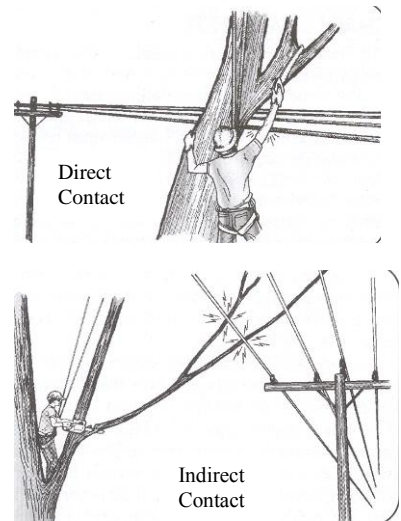
Clothing and footwear appropriate to the known job hazards shall be approved by the employer and worn by the employees. Workers shall wear head protection that conforms to ANSI Z89.1. Class E helmets shall be worn when working in proximity to electrical conductors. Face and eye protection shall comply with ANSI Z87.1. Chain saw-resistant leg protection shall be worn while operating a chain saw during ground operations. When noise levels exceed acceptable standards, as established by Federal regulations, approved hearing protection shall be provided by the employer and worn.

Effective means for controlling pedestrian and vehicular traffic shall be instituted on every job site where necessary in accordance with U.S. DOT Manual on Uniform Traffic Control Devices (MUTCD), or applicable state and local laws and regulations.

All overhead and underground electrical conductors and all communication wires and cables shall be considered to be energized with potentially fatal voltages. Only qualified line-clearance tree experts or qualified line-clearance tree expert trainees shall be assigned to work where an electrical hazard exists. Qualified line-clearance tree expert trainees shall be under the direct supervision of qualified line-clearance tree expert.



An electrical hazard exists when a worker, tool, tree, or any other conductive object is closer than ten feet from an energized electrical conductor rated 50 kV, phase-to-phase, or less. Direct contact is made when any part of the body contacts an energized line. Indirect contact occurs when any part of the body touches a conductive object that is in contact with an energized line. Conductive objects include a saw, tree branch, or another person. Even in an insulated bucket truck indirect contact can be made. Arborists and other workers shall be instructed that insulated aerial buckets do not protect them from other electrical paths to the ground, such as paths through trees or guy wires or from phase-to-phase contact. Arborist and other workers shall be instructed that electrical shock may occur as a result of ground fault when a person stands near a grounded object. Branches contacting an energized electrical conductor shall be removed using nonconductive equipment.



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When climbing a tree, the tie-in position should be above the work area and located in such a way that a slip would swing the tree expert away from any energized electrical conductor or other identified hazard.

Footwear, including lineman's overshoes, having electrical-resistant soles, shall not be considered as providing any measure of safety from electrical hazards. Rubber gloves, with or without leather or other protective covering, shall not be considered as providing any measure of safety from electrical hazards.

Qualified line-clearance tree experts and qualified line-clearance tree expert trainees performing line clearance in the aftermath of a storm or under similar conditions shall be trained in the special hazards associated with this type of work.

Aerial devices shall be provided with a point of attachment to secure a full body harness with a shock-absorbing lanyard or body-belt and lanyard. Fall protection shall be worn when working aloft.

Aerial devices shall not be used as cranes or hoists to lift or lower materials, unless specifically designed by the manufacturer to perform such operations. Wheel chocks shall be set before using an aerial device, unless the device has no wheels on the ground or is designed for use without chocks. The keys shall be removed from the ignition when vehicles and equipment are left unattended. No part of the boom or bucket shall make contact with energized electrical conductors, poles, trees or similar objects.

Brush chippers, trailer chippers, and towable stump cutters or stump cutter trailers, when detached from the vehicle, shall be chocked or otherwise secured in place.

Brush chippers equipped with a mechanical infeed system shall have a quick stop and reversing device on the in-feed system, which shall be:

- close to the feed end of the in-feed hopper;
- located across the top and along each side of the in-feed hopper;
- within easy reach of the worker.

Vision, hearing and/or other appropriate personal protective equipment shall be worn when in the immediate area of a brush chipper in accordance with ANSI Z133.1 standards.

ANSI Z133.1 standards require that when a chain saw is being started, it shall be held firmly in place on the ground or otherwise supported in a manner that minimizes movement of the saw when the starter handle is pulled. The chain saw shall be started with the chain brake engaged. Drop-starting a chain saw is prohibited. Chain saw safety devices may not be removed or modified and shall be operational.

The kickback zone of a chainsaw is the front upper quadrant. Kickback happens while, in making a cut, the top of the bar nose contacts a solid object or is pinched. This causes the guide bar to fly back towards you. Kickback occurs at a rate twice as fast as a human can react.

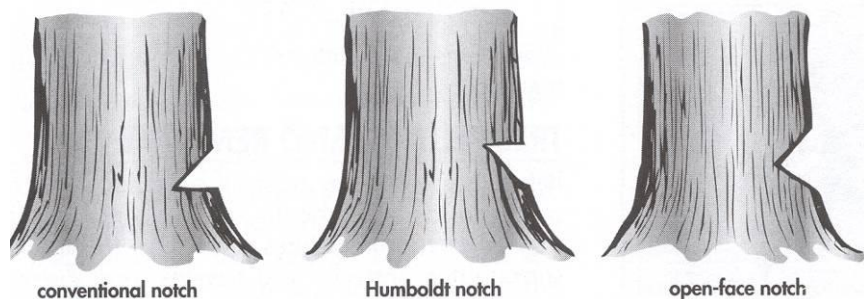
The direction of safe retreat when felling a tree is 45 degrees from the sides and back on either side. NEVER move away directly behind the tree as you can be seriously hurt if the tree butt kicks back during the fall. Using a bore cut and a release cut will make it easier to retreat in plenty of time. Don't turn back on the falling tree. Walk quickly away to a distance of 20 feet or more from the falling tree and position yourself behind a standing tree if possible.

When manual tree felling, notches and back cuts shall be made at a height that enables the chain saw operator to safely begin the cut, control the tree or trunk, and have freedom of movement toward a retreat/escape path. The notch cut used shall be a conventional notch, an open-face notch, or a Humboldt notch. Notches shall be used for felling all trees over 5 inches diameter at breast height.

A conventional notch is a directional felling cut into the side of a tree, facing the intended direction of fall and consisting of a horizontal face cut and an angle cut above it, creating a notch of approximately 45 degrees. A Humboldt notch

is a directional felling cut facing the direction of fall and consisting of a horizontal face cut and an angled cut below it. A Humboldt cut

is usually reserved for larger trees on steep slopes. An open-faced notch is a directional felling cut facing the intended direction of fall and consisting of two angled cuts creating a notch



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greater than 70 degrees. Be sure that the notch depth does not exceed 1/3 the diameter of the tree and that the back cut does not penetrate into the predetermined hinge area.

When limbing and bucking, the tree expert must stand on the uphill side of the work. Whenever possible, cut limbs on the opposite side of the tree trunk from which you are working. Doing so keeps the tree trunk between you and the saw. Wedges should be used as necessary to prevent binding of the guide bar or chain when bucking up trunks of trees.

When a tree expert or arborist is working in a tree other than from an aerial device, chain saws weighing more than 15 pounds service weight shall be secured from falling by a separate line or tool lanyard.

Before climbing any tree:

- Inspect the tree and site for potential hazards;
- Understand the objective for the climbing job;
- Wear PPE (Personal Protective Equipment) and clothing suitable for work condition and weather;
- Do not wear jewelry;
- Follow safety standards;
- Take precautions and use caution.

Tree Experts and arborists shall have three points of contact with the tree and a minimum of two means of being secured while working aloft. Carabiners used as part of a climber's work-positioning (suspension) system shall be self-closing and self-double-locking and shall have a gate-locking mechanism that requires at least two consecutive, deliberate actions to unlock.

Snap hooks (rope snaps) used as part of a climber's work-positioning (suspension) system shall be self-closing and self-locking, with a minimum tensile strength of 5,000 pounds.

A stopper knot shall be tied in the end of the arborist's climbing line to prevent pulling the rope through the climbing hitch, when working at heights greater than one-half the length of the arborist's climbing line.

A hitch is a knot used to secure a rope to an object, another rope, or the standing part of the same rope. A climbing hitch is used for securing a climber to the climbing line, permitting controlled ascent, descent and working position. Tautline, Blake's, and Prusik hitches are examples of climbing hitches.

The secured footlock is a method used to climb a suspended rope. A Prusik loop, fashioned with an acceptable friction hitch, shall be used by the climber when footlocking.

Friction hitches are used for safety in ascent, work positioning and descending. The Blake's hitch, Kleimheist knot, Prusik knot, and tautline hitch are examples.

The clove hitch, Girth hitch, sheet bend and timber hitch are examples of attachment knots. Limbs and branches can be lowered by using the clove hitch. Tree Experts and arborists should be above or to the side of the limb being lowered when large limbs are lowered in sections.

The bowline, anchor, and buntline hitches are used as end-line knots to hold on to something.